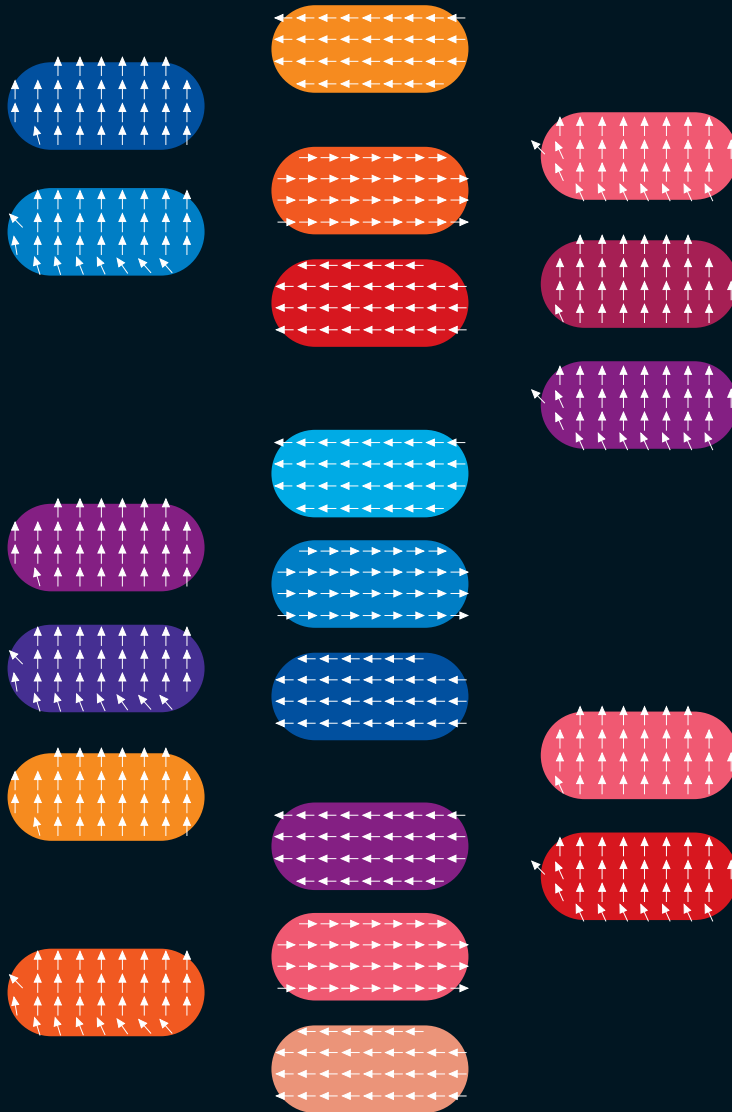


Introduction to refereeing

referees.iop.org



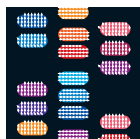


An introductory guide to refereeing

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Front cover image: An image showing time evolution of magnetic quantum cellular automata (MQCA). The arrows indicate the local magnetization direction in the nanomagnetic elements **L Gross et al 2010 *Nanotechnology* 21 325301**. Artistic interpretation by Frédérique Swist.

An introduction to the peer review process

What is peer review?

Peer review is the process used to assess an academic paper before deciding whether it should be published or not. The paper is looked at by experts in the field, known as referees, whose identities are kept anonymous. One or more referees will comment on the quality, originality and importance of the work. This information can then be used by the Editors of the journal to make a publication decision, and by the authors to improve their paper.

Why peer review?

The peer review system is essential in order to ensure that only credible, high quality research is published. It not only improves the quality

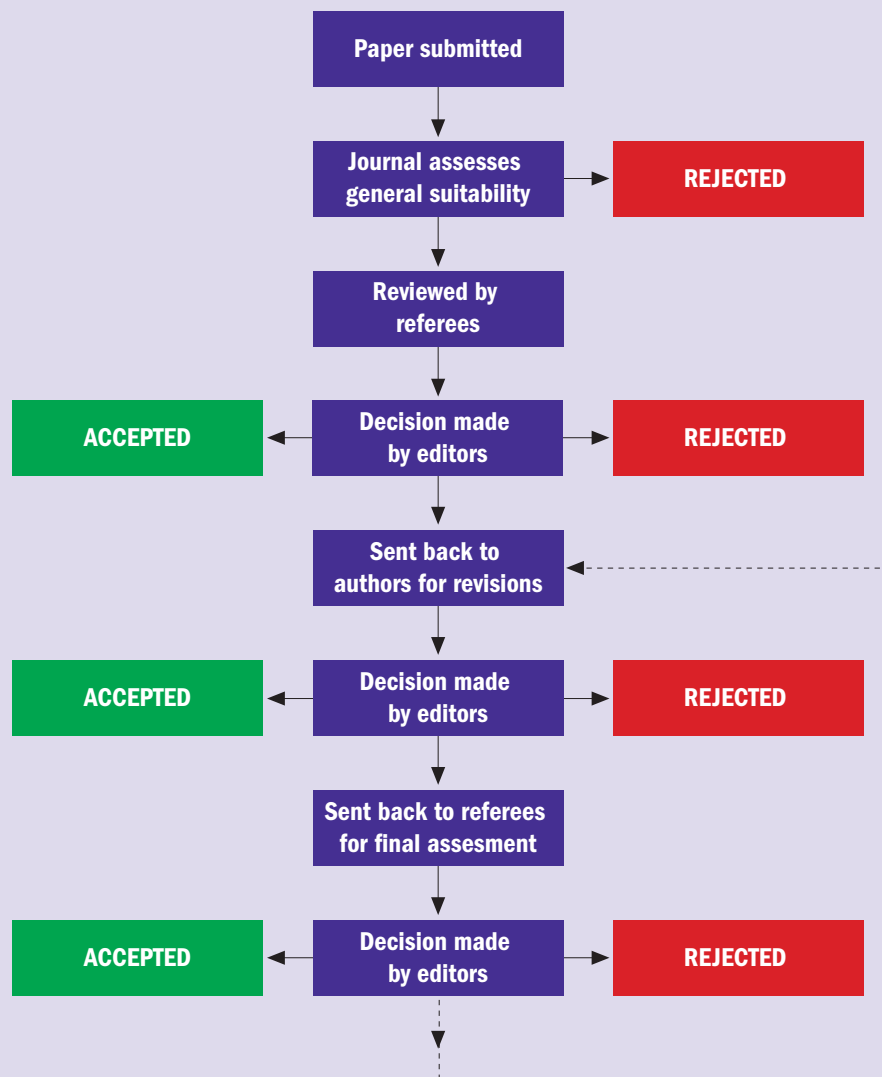
of published papers, it also ensures that readers can trust a journal to provide reliable information. As members of the scientific community, researchers are expected to referee papers. The referees also benefit from the process as it provides an opportunity to keep up to date on progress in the field and to see new and innovative research before it is published.

The peer review system is used widely throughout the world. The exact requirements of the referees may vary slightly from journal to journal; however the main aim is always to improve the paper and assure the quality of the research. This process is beneficial to the authors, the readers and to the journal itself.



Image inspired by contour maps of proton and neutron densities of intrinsic states of nuclei with cluster or halo structure **M Žáková et al** 2010 *Journal of Physics G: Nuclear and Particle Physics* **37** 055107.

The Peer Review Process



How to write a referee report

In this section we will outline the important steps involved in preparing and writing a referee report.

The aim of your report is to help the journal to decide if the work is suitable to publish. It also helps the authors improve the manuscript before it is published.

When you receive a paper

When you receive a referee request you should ask yourself the following questions:

1. Am I an expert?

Do you know the field well enough to be able to assess the

- novelty of the research
- quality of the research
- impact and importance of the research

If the answer to any of these questions is “no” then you should decline the task and tell the journal that this is not your area of expertise.

2. Will I be able to meet the deadline?

Can you prepare a report in a reasonable amount of time? Some reports take longer than others depending on how complex the work is. The authors will want a decision as soon as possible.

It is OK to ask for more time if you need it or even to decline a request if you are already working on several referee tasks. In that case, it is very helpful if you can suggest alternative referees.

3. Do I have a conflict of interest?

If you are a colleague of the authors, helped with this research or are in direct competition with the authors you should not review this work. See the ethical section in this guide for more information.

You should let the journal know as soon as possible if you can or cannot report. Give the journal a realistic time frame for preparing your report. If anything is unclear, ask the journal to explain or give you more information.

Important things to remember

- Keep it confidential
- Do not contact the authors
- Be objective: review the research, not the researcher

Steps in forming an opinion

It is important to understand the aims, scope and impact of the journal before assessing the paper. Therefore, you should begin by reading any letters and forms you have received. There may be specific journal guidelines, including information on the scope of the journal, which you should also read. These should be available online but if you cannot find them you can ask the journal for a copy of the guidelines. The guidelines may be different depending on the kind of article you have been asked to review, e.g. Letters or Fast Track Communications may have different criteria to Papers. You should then read the manuscript with these instructions and guidelines in mind.

When assessing a paper, you should ask yourself the following questions:

Is the work understandable and correct?

- Is it clear what the authors are trying to achieve?
- Are there sufficient references to provide background and put the work in context?
- Are the results backed up with evidence? Are there any unsupported claims?
- Is the work correct? Are there any errors, flaws or mistakes in the manuscript?
- Are the mathematics or statistics correct?
- Do you understand the work?

Is the work novel and interesting?

- Are the results interesting?
- Is the research important? Do the authors explain why it is important or how it advances our understanding of the field?
- Is the work original? Does it contain new material? Have any parts of the manuscript been published before?
- How relevant is this work to researchers in your field? Would it be beneficial to get an opinion from a researcher in another field?
- Is this only an incremental advance over previous work?

Is the work well presented?

- Does the title reflect the contents of the article?
- Does the abstract contain the essential information of the article?
- Are the figures and tables correct and informative? Are there too many, or too few?
- Does the conclusion summarize what has been learned and why it is interesting and useful?
- Is it clear?
- Is the manuscript an appropriate length?

You should consider all of these questions when you assess a manuscript. It is important to give as complete and thorough a report as possible.

Writing your report

All journals are slightly different but a referee request is usually made up of two parts: a form for you to fill in and a comment box for more detailed remarks. You will need to complete all the forms and answer all the questions asked by the journal.

Start your report by briefly summarising the purpose and results of the paper. This shows the authors and Editors of the journal that you have read and understood the work. In addition it is a useful summary of the results for the Editors.

Image top: An artistic interpretation of potential energy surface for LiNC $\rightleftharpoons$ LiCN accommodating superscared wavefunctions **S D Prado et al** 2009 *EPL* **88** 40003.

Continues overleaf →

How to write a referee report (continued)

It is especially important to:

- give your opinion of the level of interest and novelty of the work
- provide full references to earlier work if you believe the research does not add anything new
- be clear about what is needed to bring a paper up to the required quality standards for publication, if you think the work could eventually be published
- be specific about what is particularly interesting or good about a paper
- be specific in any criticism. Do not just say “This result is wrong” but say why it is wrong: “This result is wrong because...” for example “the following assumptions are invalid” or “they neglected this important factor” or “their method of collecting or analysing data is flawed” etc.
- clearly discuss any changes that you feel should be made to the manuscript

- include details of any references that the authors neglected to include or any of the references that are inaccurate
- be professional and polite in your report. Do not make personal comments or criticize the authors individually.

Is the English understandable?

There is no need to correct every spelling or grammatical error in the paper. However, it is helpful to point out where the scientific meaning is unclear.

Recommendation

Finally you should make a recommendation to the journal. The Editors of the journal will decide whether to reject, accept or reassess the work after changes are made based on the reports and recommendations of the referee(s).

DO...

- send your report on or before the agreed deadline
- keep the journal informed about the progress of the report
- follow the instructions sent from the journal
- contact the journal if you have any questions
- give examples to make your meaning clear
- comment on what is interesting, important, novel or significant about the work (if anything)
- be unbiased and objective

DON'T...

- do nothing! If you are unable or unwilling to referee the paper tell the journal.
- agree to report but then fail to send it. Instead ask for more time or let the journal know you can no longer report.
- contact the authors under any circumstances. If you have a question for the authors, ask the journal to forward it.
- make statements/claims about the work without providing an explanation and evidence
- personally criticize any of the authors
- just focus on correcting English; be sure to comment on quality of research
- recommend accepting or rejecting the paper without giving reasons

After you submit your report

Once you have submitted your report your involvement in the review process may be finished. However, depending on the decisions made by the journal, you may be asked to look at a revised version of the paper.

What happens to your report?

Your report, along with that of any other referees, will be seen by the journal Editors. They will assess the referee reports and make a decision on how to proceed. If the referee reports agree, the decision will be made to either:

- accept the paper without any amendments
- ask the authors to revise the paper
- reject the paper

If the article is accepted without any amendments or is rejected outright your job will be complete. If the authors need to make revisions, you may be asked to provide further assessment of the manuscript. Some journals allow authors to appeal against a decision to reject their article. This may mean that you are asked to comment on the appeal or that a paper you have recommended for rejection is published.

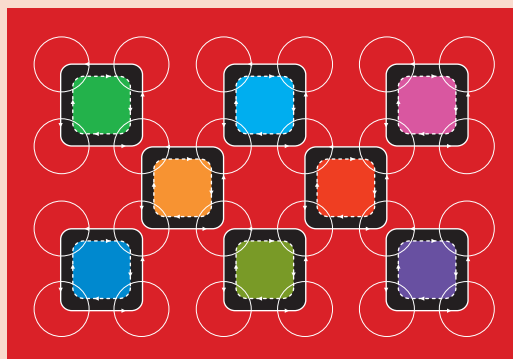
Revisions

If you are asked to look at a revised manuscript, a list of changes to the article may be included (this will have been provided by the author). You should judge the revised manuscript to the same quality criteria as you did the original version. If the authors have not addressed your concerns satisfactorily make this clear in your report.

Adjudications

If the referee reports do not agree the journal may consult an adjudicator. An adjudicator is a senior referee or Editorial Board member. They are asked to provide an opinion on both the article and the referee reports. If an Editorial Board member is used they may be told the names of the referees to help them make their decision, but the authors will still only see anonymous reports.

The adjudicator may agree or disagree with your assessment of the article. If an adjudicator has been used you may receive the adjudicator's comments with any revised version of the manuscript you are asked to review. You should consider all reports during your assessment of the revised version.



Depiction of the network model for the quantum Hall spin effect in a topological insulator **S Ryu, C Mudry, H Obuse and A Furusaki** 2010 *New Journal of Physics* **12** 065005.

Ethical issues

Referees follow a set of rules in how they assess papers. Many journals have their own specific ethical policies which you should read (e.g. the ethical policy of IOP is at authors.iop.org/ethicalpolicy), but there are also some general rules for referees that are common to all journals in science.

Conflict of interest

Sometimes you may have a potential conflict of interest in reviewing a particular paper. For example:

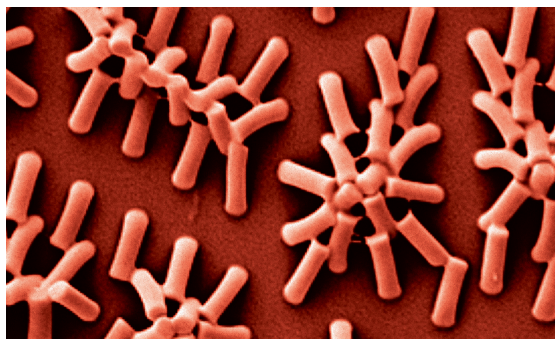
- You may be a close colleague of the authors
- You may have helped the authors with their work
- You may be involved in a directly competing effort in the same research area
- You may be involved in a business that would benefit from the authors' work if it is accepted by the journal.

If any of the above apply to you, or if for any other reason you feel uncomfortable reviewing a specific paper, you should inform the journal so they can decide if a different referee is needed. It is OK for you to decline to review a paper if you

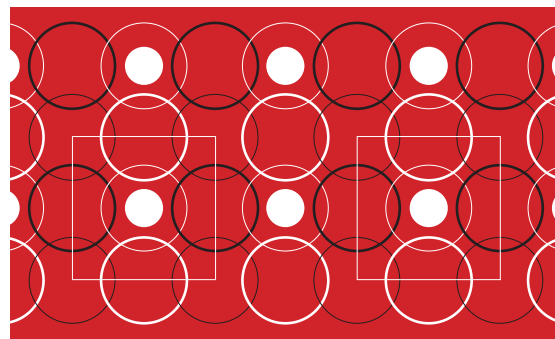
have a potential conflict of interest, and it is important you declare any such conflict at this early stage to avoid any later accusations of bias.

Papers you are asked to review are confidential

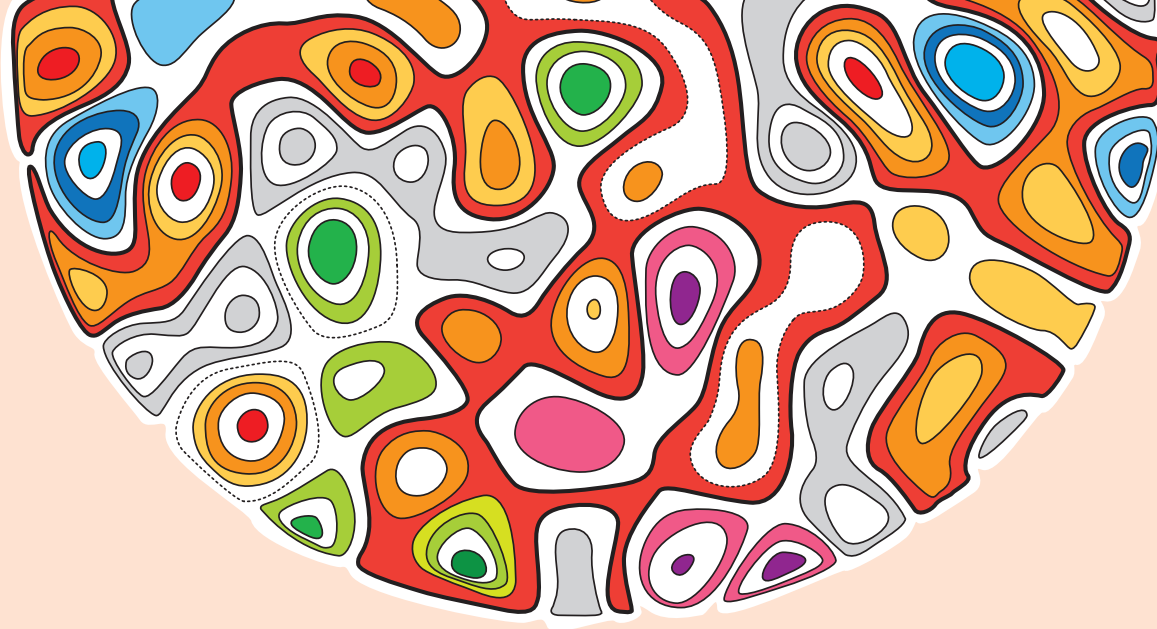
Any paper sent to you for review should be treated as confidential until it is published in a journal. You should not tell others of its contents, or that you have been asked to review it. In some cases, you may find you wish to consult a colleague for a second opinion on a paper, but in that case you should check with the journal first. The authors need to be confident that if they have major new findings to report, no-one will take unfair advantage from having seen the paper as a referee, or try to steal their ideas.



Sol-gel nanostructure obtained after radiation exposure and development during the optimization process **G Brusatin et al** 2008 *Nanotechnology* **19** 175306.



An artistic impression of a single plane view of the structure of an iron nitride crystal **S Pick et al** 2008 *Journal of Physics: Condensed Matter* **20** 075212.



Anonymity

With most journals, including all IOP journals, authors are not told who the referees for their paper are. This anonymity for referees is very important because it allows referees to give honest opinions without fear of damaging any relationship they already have with the authors. Referees' identities will be known to the journal's Editors though, so do not say anything in your report that you would not be prepared to justify if required. Names of referees may sometimes also be revealed to members of a journal's Editorial Board, but this is treated as confidential information and not revealed to the authors. It is important you send your report – even if it is entirely positive – to the journal and not to the authors directly.

Above image: Random distribution of phase modulation of a partially coherent laser beam **G P Berman et al** 2009 *Journal of Physics B: Atomic, Molecular and Optical Physics* **42** 225403.

Misconduct

Sadly, a minority of authors try to advance their careers unethically by either stealing the work of others (plagiarism) or by trying to publish the same results several times in different places (duplicate publication). Both are considered unethical practices by the scientific community. Referees play an important role in detecting misconduct of this kind. If you suspect that the paper you have been asked to review has been plagiarized, or if you have been asked to review the same paper by another journal at the same time, then you should contact the journals immediately with specific details of what you have discovered. The journals can then investigate further and take appropriate action. Several sophisticated tools exist to help journals detect plagiarism today. For example, IOP journals use CrossCheck – a database of published works that we screen new submissions against to spot any which reproduce material from already-published papers. With such tools, and with the help of vigilant referees, we are better able to stop those who engage in misconduct.

Frequently asked questions

Why should I become a referee?

Refereeing is an important responsibility that comes with being part of the scientific community and it is expected that all active scientists will undertake refereeing duties from time to time. Acting as a referee not only helps you to stay up to date with the latest developments in your field but is also commonly recognized as sign that you are progressing in your career. Scientists will often mention in their CV or resume that they have acted as referee for a journal.

Will I be paid to referee an article?

Usually not.

How much time will it take to assess a paper and write a report?

It depends on many factors including: the quality of the manuscript, your level of expertise, the subject and your own way of working. In some fields 2-3 hours would be enough; in other fields it could take 2-3 weeks. You should ask your colleagues how long they spend on a referee task.

Can I extend the deadline for submitting my report?

When you are first asked to referee a paper, the journal will usually suggest a deadline for submitting your report. If you find you cannot meet this deadline, contact the journal to request an extension or to decline.

Will the authors be told who has written the report(s)?

No, most peer-reviewed journals do not tell the authors who has written the reports. Preserving the anonymity of referees is felt to be very important.

If I am an expert in only part of the paper what should I do?

You can still write a report and send it to the journal but make it clear which parts you are not able to assess.

Can I consult a colleague about a paper I have been asked to referee?

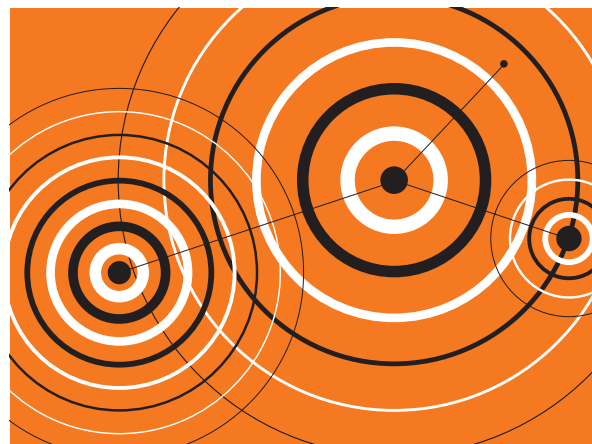
You may consult a colleague about a paper but always ask the journal if this is OK before doing it.

How long should my report be?

There is no set length for a report. It will depend on the manuscript you have been asked to assess. However, if it is less than half a page your report is probably not detailed enough.

If I think the paper is incremental, what should I do?

Tell the journal that you think it is incremental and provide a reference or references to support this.



Representation of chemotaxis, whereby a motile cell and targets interact by chemical signalling **Sarah A Nowak et al** 2010 *Physical Biology* **7** 026003.

What should I do if the authors refer to unpublished work?

It may be possible for the journal to obtain a copy for you from the authors. You should ask for this if you feel you cannot assess the work without it. However, authors should not make frequent references to unpublished work to support their paper.

Do I have to correct all spelling, grammar or use-of-English mistakes in a paper I have been asked to referee?

No. Referees are not usually asked to do this as journals have copy-editors who can correct minor problems with the language. However, if the paper is written so poorly that you cannot clearly understand what the authors mean, or there are so many errors that reading the paper becomes very difficult, then that should be reported back to the journal. Papers whose scientific meaning is unclear, or which have not been properly proof-read by the authors before submission, are usually sent back to the authors for revision.

Will I find out if the paper I refereed was rejected or accepted?

This depends on the journal. Some journals will routinely inform you of the final decision, but others do not. However, if you want to know what happened to a paper you refereed you can contact the journal and they will tell you.

Will I be able to see the reports from any other referees?

This depends on the journal policy. If you ask to see them, sometimes the journal may be able to send them to you. If an article requires a second round of refereeing after revision, you may be provided with any other referee reports so that you can assess carefully all the changes that have been made.

Where can I get more information?

This is a beginner's guide to refereeing only and is based mainly on IOP journal processes. There are many other sources of information, including your supervisor and colleagues. You can find more information about peer review at the following websites:

- Author home page, IOP Publishing
authors.iop.org
- How to survive Peer Review, BMJ Books
resources.bmj.com/bmj/pdfs/wager.pdf
- Peer review: a guide for researchers, Research Information Network
www.rin.ac.uk/our-work/communicating-and-disseminating-research/peer-review-guide-researchers

Where this guide refers to third party websites and/or other third party sources of information, it is not intending to imply any direct link with those third parties, nor does IOP Publishing warrant, or accept responsibility for, the quality or availability of any information contained therein. Where accessing any third party websites, you should ensure that you read any legal information on those websites before making use of and/or relying on any information obtained from them.

Publishing glossary

Adjudicator

An additional referee who is asked to consider an article if two or more referees disagree in their recommendation. The adjudicator typically considers both the paper and the referee comments already obtained before reaching a final decision.

Article type

Journals publish more than just research papers. Many have several different types of article, each with a different purpose. Refereeing guidelines are usually made available for each by the journal so that referees know what standards to apply for the article they have been sent. Some examples of article types are:

- **Research papers:** The main article type used by most journals. Reports new research in a detailed form.
- **Letters:** Shorter articles, often with a special urgency or a high importance, describing new research but not in as much detail as in a full paper.
- **Reviews:** Articles reviewing progress in an area, often with extensive reference lists.
- **Comments:** Short articles commenting on a previously published work.
- **Corrigenda/Errata:** Very short articles that correct an error in a published paper.

Conflict of interest

If you are a colleague of the authors, helped with the authors' research, are in direct competition with the authors, or stand to benefit financially if the authors' paper is published, then it is not appropriate for you to act as the referee for that paper. This situation is called having a "conflict of interest".

Double-blind refereeing

An alternative system of refereeing used by a few journals. Referees are not told who wrote the paper they are reviewing.

Editorial Board Members

Senior researchers who support the journal staff in maintaining and developing the journal. On some journals, Editorial Board members run the peer review process, on others they act in an advisory capacity.

Incremental Publishing

Work that makes only a minimal/insignificant advance over previously published work. This is also sometimes called "salami publishing".

Open Peer Review

An alternative peer review model where the identity of the referees is made public and all reports are signed.

Plagiarism

A form of scientific misconduct where the authors copy results or material from someone else's work, claiming it is their own work.

Quality rating

A ratings system used by IOP as a measure of the quality of a manuscript. Referees are asked to rate papers against a quality ranking on the referee report form.

Revision

A step in the process where authors are asked to revise their article in response to a list of specific comments from referees and/or Editors.

Self-plagiarism

A form of scientific misconduct where authors reproduce large amounts of their own previously published work and claim it is new material.

Single-blind refereeing

A system of refereeing where the authors are not told who the referees for their paper were. However the referees know who the authors of the paper were. Most journals use this system of refereeing.

- The Astronomical Journal*
- The Astrophysical Journal*
- The Astrophysical Journal Letters*
- The Astrophysical Journal Supplement Series*
- Biofabrication
- Bioinspiration & Biomimetics
- Biomedical Materials
- Chinese Journal of Chemical Physics*
- Chinese Physics B*
- Chinese Physics C*
- Chinese Physics Letters*
- Classical and Quantum Gravity
- Communications in Theoretical Physics*
- Computational Science & Discovery
- Environmental Research Letters
- EPL*
- European Journal of Physics*
- Fluid Dynamics Research*
- Inverse Problems
- IOP Conference Series: Earth and Environmental Science
- IOP Conference Series: Materials Science and Engineering
- Izvestiya: Mathematics*
- Journal of Breath Research
- Journal of Cosmology and Astroparticle Physics*
- Journal of Geophysics and Engineering*
- Journal of Instrumentation*
- Journal of Micromechanics and Microengineering
- Journal of Neural Engineering
- Journal of Optics*
- Journal of Physics A: Mathematical and Theoretical
- Journal of Physics B: Atomic, Molecular and Optical Physics
- Journal of Physics: Condensed Matter
- Journal of Physics: Conference Series
- Journal of Physics D: Applied Physics
- Journal of Physics G: Nuclear and Particle Physics
- Journal of Radiological Protection*
- Journal of Semiconductors*
- Journal of Statistical Mechanics: Theory and Experiment*
- Measurement Science and Technology
- Metrologia*
- Modelling and Simulation in Materials Science and Engineering
- Nanotechnology
- New Journal of Physics*
- Nonlinearity*
- Nuclear Fusion*
- Physica Scripta*
- Physical Biology
- Physics Education
- Physics in Medicine & Biology*
- Physics—Uspekhi*
- Physiological Measurement*
- Plasma Physics and Controlled Fusion
- Plasma Science and Technology*
- Plasma Sources Science and Technology
- Quantum Electronics*
- Reports on Progress in Physics
- Research in Astronomy and Astrophysics*
- Russian Chemical Reviews*
- Russian Mathematical Surveys*
- Sbornik: Mathematics*
- Science and Technology of Advanced Materials*
- Semiconductor Science and Technology
- Smart Materials and Structures
- Superconductor Science and Technology

* These titles are published in co-operation with international partners and peer review processes may vary

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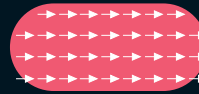
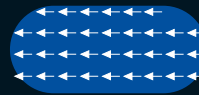
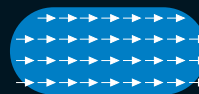
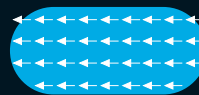
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